

Abstract

The present invention provides a gas porous media, the bulk matrix of which comprises a material having a low coefficient of thermal expansion that is also capable of retaining 99.99% or more of particles of a size of about 0.003 microns and larger at 0.2 slpm/cm² while demonstrating a permeability of $3.5 \times 10^{-12} \text{ m}^2$ and a porosity of around 62%. The porous media, preferably a membrane, is also fabricated into in such a way that the resultant assembly, in this case a frame, is capable of retaining 99.9999999% of particles greater than 0.003 um in diameter at 8.3 sccm/cm² with a permeability of $3.0 \times 10^{-13} \text{ m}^2$ and a porosity of around 53%. Both porous medias can be tailored by changing the raw materials and process to yield a range of porosities and exhibit permeability between 1.0E^{-13} and $1.0\text{E}^{-11} \text{ m}^2$.

The present invention further provides the application of this porous media in frames for supporting a pellicle and a reticle, such frames positioned in parallel relationship to each other. The frames may comprise porous media in its entirety or porous media fabricated and sealed into a solid support frame. It is possible to fabricate membrane in a variety of different porosities and desired properties.